

DOMAIN WALL FREE SHIELDS OF MR SENSORS

ABSTRACT

A magnetic reader of the present invention comprises an MR sensor shielded by a magnetic shield including single domain soft magnetic materials. The domain wall free magnetic shield includes an unbiased soft magnetic layer and a biased soft magnetic layer separated by a non-magnetic layer. The easy axis of the biased layer is oriented to create a path for magnetic flux through the biased and unbiased layers thereby reducing the demagnetization field of the shield. A biasing layer maintains the first and second magnetic layers as single domain magnets. The biasing layer is further shaped to define a quiet zone where the biasing layer does not overlay the MR sensor.